

REMARKS

Status of the Claims

Claims 1-3, 10, 12, 13 and 16-18 are pending in this application, the independent claims being claims 1 and 10. By this Amendment, claims 1 and 10 are amended, and claims 14 and 15 are canceled. Claims 4-9 and 11 previously were withdrawn from consideration and canceled pursuant to restriction requirements.

Summary of the Official Action

In the Official Action, claim 1-3, 10, 12, 13 and 15-18 were rejected under 35 U.S.C. §103(a), as unpatentable over U.S. Patent No. 4,760,073 (Tastu) in view of U.S. Patent No. 6,171,572 (Aozasa), and claim 14 was rejected under 35 U.S.C. §103(a), as unpatentable over the Tastu '073 patent and the Aozasa '572 patent, further in view of U.S. Patent No. 5,962,343 (Kasai).

Reconsideration and withdrawal of the rejections respectfully are requested in view of the above amendments and the following remarks.

Claim Amendments

Without conceding the propriety of the rejections, claims 1 and 10 have been amended more clearly to recite various novel features of the present invention, with particular attention to the Examiner's comments; claims 14 and 15 have been canceled without prejudice to or disclaimer of the subject matter recited therein. Support for the amendments may be found in the original application, e.g., in Examples 1-5 (paragraphs nos. [0055] - [0075] and [0041], respectively). No new matter has been added.

In particular, each of independent claims 1 and 10 has been amended to recite the features of a pH of 3 to 6 or 8 to 10, and a specific surface area of 2 to 200 m²/g. As illustrated and disclosed in greater detail in the present application, the claimed combination of features including a pH of 3 to 6 or 8 to 10 and a specific surface area of 2 to 200 m²/g

provides a significant improvement over the prior art, in that a stable sol is provided by forming a hydroxide of a cerium salt, and a hydroxide of a lanthanum salt or a neodymium salt, and warming and air-oxidizing at a temperature less than 100 C to form a complex oxide made of cerium oxide and lanthanum oxide or neodymium oxide. The complex oxide obtained by the claimed method has a high dispersion stability in the claimed pH range, and a high specific surface area. A stable sol containing the complex oxide made of cerium oxide and lanthanum oxide or neodymium oxide has a high removal rate as a polishing agent for semiconductor and provides a good polished face.

These features and advantages thereof are disclosed in the present specification. For example, Fig. 3 illustrates zeta potential measured for 4 sols in which particles in La/(Ce + La) molar ratio of 0, 0.01, 0.05 or 0.10 are dispersed in water. As shown in Fig. 3, the particles having a molar ratio of 0.01 (also those of 0.05 and 0.10) have a greater change in their surface potential, larger absolute values, and higher dispersion stability than those particles having a molar ratio of 0. These sols have a pH near 3 to 5 and/or 8 to 9. On the other hand, for example, where only cerium oxide (molar ratio of 0) is used, the sol has a zeta potential of approximately zero near pH of 5. As such, this sol is liable to be aggregated. Moreover, this sol does not significantly change in absolute values even when pH is altered (paragraph [0089], and Fig. 3).

Prior Art Distinguished

The rejections of the claims over the cited art respectfully are traversed.

Applicants submit that the prior art fails to anticipate the claimed invention.

Moreover, Applicants submit that there are differences between the subject matter sought to be patented and the prior art, such that the subject matter taken as a whole would not have been obvious to one of ordinary skill in the art at the time the invention was made.

Applicants submit that the applied combination of references fails to disclose or suggest a sol having the claimed combination of features. In particular, Applicants submit that the references, both individually and as combined, fail to disclose or suggest the claimed combination of features including a pH of 3 to 6 or 8 to 10 and a specific surface area of 2 to 200 m²/g, as recited in independent claims 1 and 10.

Each of the Tastu '073 patent and the Aozasa '572 patent discloses a method for producing oxides by calcination at high temperatures. The Tastu '073 patent obtains an oxide by mixing ceric oxide, lanthanum oxide and neodymium oxide, etc, and calcinating at a temperature of 850 C or more; the Aozasa '572 patent obtains an oxide by mixing zirconium oxide, a cerium sol (containing cerium ion) and lanthanum nitrate and calcinating at a temperature of 500 to 1000 C. In each case, Applicants submit that the Tastu '073 patent and the Aozasa '572 patent fails to disclose or suggest a sol having a full, high dispersion stability, as disclosed in the present application; rather, Applicants submit that in the Tastu '073 patent and the Aozasa '572 patent processes, when the oxide obtained by calcination is dispersed in an aqueous medium, it merely provides a slurry containing the oxide.

Applicants submit that at the time the invention was made one of ordinary skill in the art would not expect, based on the teaching of the applied art, that a sol in which particles having La/(Ce + La) molar ratio of 0.005 to 0.15 are dispersed could be stably dispersed in the claimed pH range and provide excellent results in polishing tests compared with a sol having only cerium oxide (molar ratio of 0).

The Kasai '343 patent relates to a process for producing crystalline ceric oxide particles and abrasive, and was cited for its disclosure of an abrasive which is adjusted with an acidic substance to a pH of 1 to 6. Without conceding the propriety of the Examiner's characterization of the Kasai '343 patent disclosure, Applicants submit that the Kasai '343 patent fails to disclose or suggest at least the above-discussed combination of features of the

claimed invention, and fails to add anything to the Tastu '073 patent and the Aozasa '572 patent that would make obvious the claimed invention.

For the above reasons, Applicants submit that claims 1 and 10 are allowable over the cited art.

Claims 2, 3, 12, 13 and 16-18 variously depend from claims 1 and 10, and are believed allowable for the same reasons. Moreover each of these dependent claims recites additional features in combination with the features of its respective base claim, and is believed allowable in its own right. Individual consideration of the dependent claims respectfully is requested.

Conclusion

Applicants believe the present Amendment is responsive to each of the points raised by the Examiner in the Official Action, and submit that the application is in condition for allowance. Favorable consideration of the claims and passage to issue of the application at the Examiner's earliest convenience earnestly are solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Christopher Philip Wrist
Registration No. 32,078

JAO:CPW/amw

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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